

**APPLICATION**  
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TITLE                SYSTEM AND METHOD FOR INVOICE  
IMAGING THROUGH NEGATIVE  
CONFIRMATION PROCESS

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**INTERNATIONAL BUSINESS MACHINES CORPORATION**

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# SYSTEM AND METHOD FOR INVOICE IMAGING THROUGH NEGATIVE CONFIRMATION PROCESS

## Background of the Invention

### Cross References to Related Applications

5           The following U.S. patent applications, filed  
concurrently or otherwise copending, are assigned to the  
assignee hereof and contain subject matter related, in  
certain respect, to the subject matter of the present  
application.

10          Serial No. 09/657,215, filed 7 Sep 2000, entitled "System and  
Method for Clustering Servers for Performance and Load  
Balancing", assignee docket END9-2000-0104-US1;

15          Serial No. 09/657,216, filed 7 Sep 2000, entitled "System  
and Method for Front End Business Logic and Validation",  
assignee docket END9-2000-0105-US1;

Serial No. 09/657,217, filed 7 Sep 2000, entitled "System  
and Method for Data Transfer With Respect to External  
Applications", assignee docket END9-2000-0106-US1;

Serial No. 09/656,037, filed 7 Sep 2000, entitled "System and Method for Providing a Relational Database Backend", assignee docket END9-2000-0107-US1;

5 Serial No. 09/656,803, filed 7 Sep 2000, entitled "System and Method for Providing a Role Table GUI via Company Group", assignee docket END9-2000-0108-US1;

Serial No. 09/656,967, filed 7 Sep 2000, entitled "System and Method for Populating HTML Forms Using Relational Database Agents", assignee docket END9-2000-0109-US1;

10 Serial No. 09/657,196, filed 7 Sep 2000, entitled "System and Method for Catalog Administration Using Supplier Provided Flat Files", assignee docket END9-2000-0110-US1; and

15 Serial No. 09/657,195, filed 7 Sep 2000, entitled "System and Method for Providing an Application Navigator Client Menu Side Bar", assignee docket END9-2000-0111-US1.

Serial No. 09/\_\_\_\_\_, entitled "SYSTEM AND METHOD FOR AUTOMATING INVOICE PROCESSING WITH POSITIVE CONFIRMATION", assignee docket number END9 2000 0165 US1.

END9 2000 0175 US1

Serial No. 09/\_\_\_\_\_, entitled "SYSTEM AND METHOD FOR  
GENERATING A COMPANY GROUP USER PROFILE", assignee docket  
number END9 2000 0166 US1.

5 Serial No. 09/\_\_\_\_\_, entitled "SYSTEM AND METHOD FOR  
SHARING DATA ACROSS FRAMES USING ENVIRONMENT VARIABLES ",  
assignee docket number END9 2000 0167 US1.

Serial No. 09/\_\_\_\_\_, entitled "SYSTEM AND METHOD FOR  
SYNCHRONIZING LEDGER ACCOUNTS BY COMPANY GROUP", assignee  
docket number END9 2000 0168 US1.

10 Serial No. 09/\_\_\_\_\_, entitled "SYSTEM AND METHOD FOR  
GROUPING COMPANIES ACCORDING TO ACCOUNTING SYSTEM OR RULES",  
assignee docket number END9 2000 0169 US1.

15 Serial No. 09/\_\_\_\_\_, entitled "SYSTEM AND METHOD FOR FRAME  
STORAGE OF EXECUTABLE CODE", assignee docket number END9  
2000 0174 US1.

Serial No. 09/\_\_\_\_\_, entitled "SYSTEM AND METHOD FOR  
LEVERAGING PROCUREMENT ACROSS COMPANIES AND COMPANY GROUPS",  
assignee docket number END9 2000 0176 US1.

Serial No. 09/\_\_\_\_\_, entitled "SYSTEM AND METHOD FOR  
PROCESSING TAX CODES BY COMPANY GROUP", assignee docket  
number END9 2000 0177 US1.

Serial No. 09/\_\_\_\_\_, filed 2 March 2001, entitled "SYSTEM  
AND METHOD FOR MANAGING INTERNET TRADING NETWORKS", assignee  
docket number END9 2000 0178 US1.

The above-identified patent applications are incorporated  
herein by reference.

#### Technical Field of the Invention

This invention pertains to invoice processing. More  
particularly, it relates to a system and method for  
capturing and rendering invoices viewable on the web.

#### Background Art

Historically, payments of invoices are triggered by a  
three way match: the invoice must match the purchase order  
(PO) terms and conditions, and the goods received must match  
those stated in quality and quantity against that PO. A

problem occurs, particularly with respect to general procurement items, when such items are not tangible things which come through a receiving dock. In this case, it is difficult to do the three way match. For example, services  
5 may not flow through a dock. As a result, procurement systems have defined an "invoice not received" situation, which results in payment not being made until someone does something -- and that initiates what is referred to as a paper chase.

10 Some procurement systems implement a "negative confirmation" process which results in payment of an invoice unless a requester submits a rejection. In this process, when an invoice is received, a notification is given to the requester alerting him to fact that the invoice will be paid  
15 unless requester sends back a notification that it should not be paid.

Invoices may be received via mail (paper invoices) or electronically (EDI, as IDOC invoices). In a negative confirmation system, it is important that invoice data be  
20 provided to a customer requester, and this has, in the case of paper invoices, resulted in the need to transfer paper copies, and in the case of electronic invoices, paper

printouts or electronic summaries. In the case of paper  
copies, this involves the handling of large amounts of paper  
with the possibility of loss or delay adversely impacting  
the negative confirmation process, and in the case of  
5 electronic summaries providing information which may not be  
complete and sufficiently clear for quick human processing.

Another problem with negative authorization is that,  
while it may work fine for low cost things, for larger (more  
expensive) things, the risk that payment will be made before  
10 negative confirmation could be received may be too great.

It is an object of the invention to provide an improved  
system and method for processing invoices.

It is a further object of the invention to provide a  
15 system and method for processing invoices according to  
either a positive or negative approval process.

It is a further object of the invention to provide a  
system and method for processing both electronic and paper  
invoices by either a positive or negative approval process  
20 and with electronic capture and storage of all invoices for  
viewing by a customer approver.

## Summary of the Invention

A system and method for processing invoices, the method including the ~~of~~ preparing of an invoice image; storing  
5 the invoice image in an image store; keying said image to invoice data; communicating invoice confirmation request to an approver, the request including invoice data and a link to the invoice image; and responsive to approver selection of the link, displaying the invoice image.

10 In accordance with an aspect of the invention, there is provided a computer program product configured to be operable for processing invoices.

Other features and advantages of this invention will become apparent from the following detailed description of  
15 the presently preferred embodiment of the invention, taken in conjunction with the accompanying drawings.



## Brief Description of the Drawings

Figure 1 is a high level system diagram illustrating an enterprise system for providing procurement services with respect to a plurality of vendors on behalf of a plurality of company groups of related customer companies in accordance with the preferred embodiment of the invention.

Figure 2 is a high level system diagram illustrating the LPN application architecture of the preferred embodiment of the invention.

Figure 3 is a diagram illustrating the inputs and outputs of the customer requisition catalog (RCW) component of the architecture of Figure 2.

Figure 4 is a diagram illustrating, inter alia, the inputs and outputs of the enterprise EDI translator 44 of the architecture of Figure 2.

Figure 5 is a diagram illustrating the inputs and outputs of the enterprise procurement system 42 of the architecture of Figure 2.

Figure 6 is a diagram illustrating the inputs and outputs of the enterprise procurement hub server of the architecture of Figure 2.

5           Figure 7 is a diagram illustrating the system and method of the invention for capturing and rendering invoices viewable on the web in accordance with the preferred embodiment of the invention.

10           Figures 8-12 represent a series of screen captures illustrating the user interface for requester processing of invoice confirmations.

### **Best Mode for Carrying Out the Invention**

15           Referring to Figure 1, the procurement services organization of an enterprise 244 provides procurement services to a plurality of companies 248, 249 organized in a plurality of company groups 241-243 with respect to a plurality of vendors 245-247.

Referring to Figure 2, the architecture of system

components administered by enterprise 244 includes a customer requisition and catalog (ReqCatWeb, or RCW) system 40, an enterprise procurement system (SAP) 42, an enterprise data interchange, or EDI translator system 44, an enterprise (LPN) hosted data warehouse 50, an enterprise procurement hub server 52. Also illustrated in Figure 2 are a customer requester web terminal 46 and vendors 48.

ReqCatWeb 40 is a front-end interface between the user and the procurement system, providing access to catalogs and commodities, to order the day-to-day items required for the business.

SAP 42 is the back-end purchasing engine of the enterprise, such as is supported by IBM, accepting the requisitions from the front-end ReqCatWeb 40, and generating EDI transactions, as well as the accounting transactions for the requisitions, etc.

EDI (Electronic Data Interchange) 44 is an application that interacts with suppliers by sending standardized transactions for purchase orders, receiving invoices, etc.

LPN Hosted DataWarehouse 50 is a data-warehouse

facility for storing all transactions that occur in the system; used as a tool for monitoring transactions and gathering statistics.

Hub Server 52 is a back-end processing server for transferring data between elements (that is, servers) of the system.

Customer ERP System 54 is a back-end purchasing system as supported by the customer.

Referring to Figure 3, the inputs to customer RCW system 40 from procurement system 42 include requisition status 41, purchase order (PO) status and contracts 43, cost centers 45, currency exchange rates 47, general ledger (G/L) accounts 49, PO history invoices 53, PO history receipts 55, and confirmations 56. The outputs from customer RCS system 40 to procurement system 42 include requisitions 51 and positive confirmation responses 57.

The inputs to customer RCW system 40 from a customer requester browser 46 include submit requisition, and outputs from system 40 to browser 46 include approval/rejection notice 62, status display 63, and negative/positive/INR

confirmation. Notice and response data 65 is exchanged  
between RCW system 40 and browser 46.

Other inputs to RCW system 40 include vendor catalogs  
73 from vendors 245-247 via enterprise EDI translator 44,  
5 postal code validation data 74 from an enterprise RCW system  
(not shown), and human resource extract data 70 from  
enterprise hub server 52. RCW system 40 also provides  
approval notices 72 and receives approve/reject data 71.  
Approval Notices go to the departmental approvers for the  
10 person creating the requisition. These can be the  
requester's managers (first-line, second-line, etc), as well  
as chemical approvers, commodity approvers, financial  
approvers, etc.

Referring to Figure 4, enterprise procurement system 42  
15 receives as inputs from customer RCW system 40 requisitions  
51 and positive confirmation responses 57, and provides to  
customer RCW system 40 requisition status data, purchase  
order status and contracts data 43, cost center data 45,  
currency exchange rates 47, G/L accounts 49, PO history  
20 invoices 53, PO history receipts 55, and confirmations 56.

Inputs to procurement system 42 from hub server 52

include cost center data 79, and outputs to hub server 52  
include BDW extracts, company process control table 76,  
vendor master updates 77, and accounting detail 78.

Inputs to procurement system 42 from enterprise EDI  
5 translator 44 include IDOC PO acknowledgment 88, IDOC  
invoices 89, IDOC payment status 92 and file transfer check  
reconstruction 93. Outputs to EDI translator include IDOC  
PO 87, IDOC invoice rejection 90 and IDOC payments 91.

Inputs to enterprise procurement system 42 from SAP  
10 operator terminals include process PO's, RFQ, and contracts  
data 81, create/change vendor master data 82, invoice  
processing 83 (which is one input to a general procurement  
invoicing function within procurement services system 42),  
payment proposal data 84, and payment post and print 85.  
15 Also input to procurement system 42 is currency exchange  
rate data 80 from an external financial services server (not  
shown) via an enterprise currency exchange rates server (not  
shown), and output from procurement system 42 to vendors 48  
are paper or fax PO documents 86.

20 Referring to Figure 5, inputs to enterprise EDI  
translator 44 from procurement system 42 include IDOC PO 87

and IDOC invoice reject 90, and outputs to SAP system 42 include IDOC PO acknowledge 88, IDOC invoice 89, IDOC payments 91, IDOC payment status 92 and file transfer check reconstruction 93.

5           Inputs to enterprise EDI translator 44 from vendor 48 include PO acknowledge 95 and invoice 96, and outputs to vendor 48 include electronic purchase order 94 (as distinguished from paper or fax POs 86) and invoice reject 97. EDI translator also receives payments 32 from source 32 and provides payments to customer EDI translator 30. Bank 10 32 provides cashed checks and payment status to EDI translator 44. Vendor 48 provides goods shipments 35 to customer receiving 34, and receives back goods returns 36. Vendor 48 receives paper or fax purchasing documents 37 from 15 SAP 42, and provides paper invoices 38 (as distinguished from electronic invoices 96) to enterprise accounts payable for invoice processing 83 at SAP 42.

*In accordance with the preferred embodiment of the invention, there is a difference between the hub server 52 20 and the customer ReqCatWeb 40. Hub server 52 is where the confirmation notices are generated (negcons, poscons, item*

not received (inr)) and sent via e-mail to the requesters,  
or initiators, and the summary reports to the managers. The  
negative confirmation rejections are not handled by any of  
these systems, but by a note to a designated recipient,  
5 defined in a configuration file (Notes Document), and done  
entirely via e-mail. Positive confirmations are handled at  
the user-interface level by ReqCatWeb 40, but the recording  
of the accept or reject of the positive confirmation is  
handled in hub server 52, as both ReqCatWeb 40 and hub  
10 server 52 share access to the database system where all the  
confirmation data for a given purchase is stored.

Referring to Figure 6, enterprise procurement services  
hub server 52 receives as inputs from procurement system 42  
BDW extracts 75, company process control table 76, vendor  
15 master updates 77 and accounting detail 78, and provides  
cost centers data 79 (which it receives from customer ERP  
system 54.) Hub server 52 provides human resource extract  
data 70, extracted from customer employee data 60, to  
customer RCW system 40.

20 Hub server 52 provides to customer ERP system 54 vendor  
master data 26, invoice detail 27, payment detail 28 and  
blank clearing detail data 29, and receives cost centers



data 25. Customer ERP system 54 also receives goods receipts 66 from customer receiving 34.

Hub server 52 provides BDW extracts 58 to data warehouse 50.

5           The operation and inter relationships of elements of the architecture of Figures 2-b6 pertinent to the present invention will be described hereafter in connection with preferred and exemplary embodiments of the systems and methods of the invention.

10           Referring to Figure 7, in accordance with the preferred embodiment of the invention, a customer requester workstation is connected via a user interface 431 to a front-end requisition and catalog system (Req/Cat Web, or RCW) 40. RCW 40 is connected via interface 432 with  
15           procurement services system (SAP) 42. SAP 42 is in electronic or physical communication with vendor 48. An image system and store 24 is connected to scanner 23, via interface 437 with SAP system 42, and via interface 438 with workstation 438.

20           In operation, the system of Figure 7 supports a process

for requisitioning and purchasing commodities and for capturing invoices and storing them for viewing on the web.

A customer requester 46 interfaces RCW 40 to prepare an purchase request, which is passed as a requisition over interface 432 to SAP 42. SAP 42 prepares from the requisition a purchase order which is sent via EDI as IDOC PO 87 or as paper purchasing document 86 to vendor 48. Vendor, or supplier, 48 fills the order and sends back an invoice, either electronically as IDOC invoice 89 to SAP 42, or as paper invoice 38 which is received and processed by accounts payable personnel. As is represented by line 436 and block 83, accounts payable personnel 22 process paper invoice information to SAP 42. SAP 42 posts the invoice back to RCW 40 which will then send an e-mail notice to user 46 that the invoice will be paid either with (positive) or without (negative) confirmation.

As invoices are received in accounts payable 22, the paper documents are sorted and batched, and then scanned by scanner 23 into scanned image file 24. This scanning may be done in connection with invoice processing 83 and, in either event, when processing the invoice to SAP 42, data is provided identifying the invoice image in store 24. When

posting the invoice to RCW 40 for confirmation, the data bridged to RCW 40 by SAP 42 includes unique identifiers that are specific to the invoice and are pointers to the invoice image in store 24.

5           Responsive to invoice and image data received from SAP 42, RCW 40 prepares a confirmation notice which is sent by e-mail to customer 46. This notice includes url strings which, upon selection by requester 46, are executed to present the invoice images of the invoice from store 24 at  
10           requester workstation 46.

Requester 46 is also provided a search interface in RCW 40 that allows a requester to enter criteria and have images of invoices that match that criteria be displayed at workstation 46. Similarly, this interface is available to  
15           accounts payable workstations 22 for the same purpose.

There is also allowance for financial review personnel to view invoices based on various criteria, including by company or company grouping, or all invoice images.

Invoices 89 received via electronic interchange data (EDI) are, preferably on a batch basis, converted into text

and image files that have the look and feel of paper invoices, and are thus user friendly, or easily understood. As is represented by interface 437, these invoice files are also sent to image system and store 24 and linked with  
5 corresponding invoice files in SAP 42 and viewable by requester 46 when processing a positive or negative confirmation request.

Figures 8-12 represent a series of screen captures illustrating the user interface for requester processing of  
10 invoice confirmations.

In Figure 8, the requester is presented with a confirmations panel that includes buttons or tabs for selecting, inter alia, a listing of current confirmation notices and a search of invoice images. The buttons at the  
15 tope allow the user to view all invoice images, search for a particular invoice image and to move forward or back between screens.

Selecting "View All" from the screen of Figure 8 results in a display like that of Figure 9. To search for a  
20 particular invoice, the user clicks on the search button and in response is presented a screen in which to enter search

arguments. After entering the search arguments and clicking on the search button the user is presented with a screen like that of Figure 9, an example of a search for country CA, company ONCA, and invoice 310000002. Upon clicking on a particular invoice in the invoice images list of the screen of Figure 9, the user is presented with a screen, like that of Figure 10, showing the actual invoice that is associated with the selected invoice key. Figure 11 illustrates that various zoom and fit functions are afforded to the user to work with the invoice image.

### **Advantages over the Prior Art**

It is an advantage of the invention that there is provided an improved system and method for processing invoices.

It is a further advantage of the invention that there is provided a system and method for processing invoices according to either a positive or negative approval process.

It is a further advantage of the invention that there

is provided a system and method for processing both electronic and paper invoices by either a positive or negative approval process and with electronic capture and storage of all invoices for viewing by a customer requester.

5

### Alternative Embodiments

It will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without departing from the spirit and scope of the invention. In particular, it is within the scope of the invention to provide a computer program product or program element, or a program storage or memory device such as a solid or fluid transmission medium, magnetic or optical wire, tape or disc, or the like, for storing signals readable by a machine, for controlling the operation of a computer according to the method of the invention and/or to structure its components in accordance with the system of the invention.

Further, each step of the method may be executed on any general computer, such as an IBM System 390, AS/400, PC or the like and pursuant to one or more, or a part of one or more, program elements, modules or objects generated from any programming language, such as C++, Java, Java Script, Pl/1, Fortran or the like. And still further, each said step, or a file or object or the like implementing each said step, may be executed by special purpose hardware or a circuit module designed for that purpose.

Accordingly, the scope of protection of this invention is limited only by the following claims and their equivalents.